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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,590	09/12/2005	Miodrag Temerinac	Micronas.7839	9696

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EXAMINER	
JOSEPH, JAISON	

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/519,590	TEMERINAC ET AL.	
	Examiner	Art Unit	
	JAISON JOSEPH	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☒ Claim(s) *11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 4, 6 – 10, 12 – 14, and 16 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Micic et al (US Patent 4,621,374) in view of Nafie et al (US PAP 2005/0058216).

Regarding claim 1, Micic et al teach a method for wireless transmission of audio signals between a transmitting device and a receiving device (see figure 1), the receiving device having an audio signal reproduction device (see figure 1), the method comprising the steps of: digitizing the audio signals (see figure 2, Analog to digital converter); coding the digitized audio signals (see figure 2); transmitting the coded digitized audio signals (see figure 2) receiving the transmitted data streams (see figure 2 and 3); decoding the received data streams (see figure 2 and 3); outputting the

decoded data streams through the audio signal reproduction device (see figure 2 and 3). Micic et al does not expressly teach applying transmit diversity to the transmit symbols. However in analogous art, Nafie et al teach a transit diversity system including transmitter diversity between the transmitting device and the receiving device using separate data streams (see figure 1 and 2) where the transmitting device includes two transmitters (see figure 1) each having an associated antenna (see figure 1, antennas 128 and 130) and operating in the same frequency band (Nafie describes a Bluetooth system which has specific frequency band) the receiving device having at least one receiving antenna (see figure 4, component 400) and at least one receiver for the frequency band (see figure 4). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teaching of Nafie et al's diversity system in Micic et al's transmitter. The motivation or suggestion to do so is to reduce the effects of fading in wireless channel.

Regarding claim 2, which inherits the limitations of claim 1, Micic et al further teach where the step of digitizing further comprises the step of digitizing the audio signals into a data sequence (see figure 2), Nafie et al further teach where the method further comprises the steps of: converting the data sequence into a first and second data sequence of successive symbol pairs (see figure 2 and paragraph 17 and page 3, right hand column lines 1 - 15), wherein in the first and second data sequence the symbol pairs that are related in time include the same symbols (see figure 2 and paragraph 17 and page 3, right hand column lines 1 - 15); transposing the order of the symbols within the symbol pairs in the first and second data sequence relative to each

other in a time sequence (see figure 2 and paragraph 17 and page 3, right hand column lines 1 - 15); and implementing a change in coding of quadrature signal components representing the coded digitized audio signals, wherein the change in coding relates to a sign of the symbol (see figure 2 and paragraph 17 and page 3, right hand column lines 1 - 15).

Regarding claim 3, which inherits the limitations of claim 2, Nafie et al further teach where the change in coding relates to a transformation of the symbol to its complex conjugate value (see figure 2 and paragraph 17 and page 3, right hand column lines 1 - 15).

Regarding claim 4, which inherits the limitations of claim 1; Nafie et al further teach where each digitized audio signal has a plurality of discrete data points, and where the step of coding further comprises the step of assigning a symbol in a quadrature signal plane to each discrete data point (see page 3, left hand column lines 59 – right hand column line 2).

Regarding claim 6, which inherits the limitations of claim 1, Micic et al further teach, where the separate data streams are transmitted as data packets, each packet including header information comprising control and auxiliary information, each packet including data corresponding to the audio signals where each packet includes an even number of data blocks by which data associated with a first and second audio channel are alternately transmitted in blocks (see column 3, lines 50 – 60).

Regarding claim 7, Micic et al teach a system for wireless transmission of digitized audio signals (see figure 1 and 2) , comprising: a transmitting device (see

figure 1); and a receiving device (see figure 1); where the transmitting device includes a coding device that codes the digitized audio signals as data packets (see figure 1, components cp and sp), and where the receiving device includes an audio reproduction device and at least one receiver that receives the transmitted quadrature signals (see figure 3), the receiving device further includes a decoder that decodes the received quadrature signals and provides a decoded audio signal to an audio reproduction device (see figure 3). Micic et al does not expressly teach applying transmit diversity to the transmit symbols. However in analogous art, Nafie et al teach a transit diversity system including two transmitters that generate quadrature signals (see figure 1 and 2) in the same frequency band (Nafie describes a Bluetooth system which has specific frequency band) which are modulated with the data packets and are transmitted by a corresponding antenna for each transmitter; where the antennas are located in a spatial relationship for transmitter diversity operation (see figure 2 and paragraph 17 and page 3, right hand column lines 1 - 15). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teaching of Nafie et al's diversity system in Micic et al's transmitter. The motivation or suggestion to do so is to reduce the effects of fading in wireless channel.

Regarding claim 8, which inherits the limitations of claim 7, Nafie et al further teach where the digitized audio signals are arranged in a first data sequence (see figure 1), the coding device generates a pair of data sequences from the first data sequence (see figure 1), and where the transmitting device include quadrature mixers that convert

the pair of data sequences to the same high-frequency band and provide the converted data sequences to the corresponding antennas for transmission (see figure 1).

Regarding claim 9, which inherits the limitations of claim 8 Nafie et al further teach where the coding device generates the pair of data sequences based on a space-time block code (see figure 1).

Regarding claim 10, which inherits the limitations of claim 8, Nafie et al furterh teach where the pair of data sequences each includes data that represents symbols arranged as successive symbol pairs that are related in time (see figure 2 and paragraph 17 and page 3, right hand column lines 1 - 15).

Regarding claim 12, Micic et al teach a system for wireless transmission and reception of audio signals (see figure 1), comprising a transmitter side (see figure 1) and a receiver side (se figure 1), where the transmitter side comprises: a source of audio signals that provides the audio signals in a data sequence (see figure 1); an encoder that codes the data sequence into a data streams (see figure 1); a transmitter transi the data stream (see figure 1); and where the receiver side comprises a receiving antenna that receives the transmitted pair of data streams (see figure 3); a receiver that processes the received data streams (see figure 3); a decoder that recovers the data sequence from the processed data streams and provides an audio signal in response thereto (see figure 3); and an audio reproduction device that outputs the audio signal from the decoder (see figure 3).). Micic et al does not expressly teach applying transmit diversity to the transmit symbols. However in analogous art, Nafie et al teach a transit diversity system having an encoder that encodes the data into a pair of data

sequences (see figure 1), a pair of transmitters that each transmits a corresponding one of the pair of data streams (see figure 1); and a pair of transmitting antennas each associated with a corresponding one of the pair of transmitters (see figure 1), the transmitting antennas being located in a spatially-separated transmitter diversity relationship with each other, the antennas transmitting the corresponding one of the pair of data streams on a frequency that is that same for each antenna (see figure 1 and Nafie describes a Bluetooth system which has specific frequency band). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teaching of Nafie et al's diversity system in Micic et al's transmitter. The motivation or suggestion to do so is to reduce the effects of fading in wireless channel.

Regarding claim 13, which inherits the limitations of claim 12, Micic et al further teach where the audio signals are in analog format, and where the transmitter side digitizes the audio signals (inherent).

Regarding claim 14, which inherits the limitations of claim 12, Micic et al further teach where the audio signals are in digital format (see figure 2).

Regarding claim 16, which inherits the limitations of claim 12, Nafie et al further teach where the encoder codes the data sequence into a pair of data streams each comprising symbols (see figure 2 and paragraph 17 and page 3, right hand column lines 1 - 15).

Regarding claim 17, which inherits the limitations of claim 16, Nafie et al further teach where the transmitters transmit the data streams comprising symbols using

quadrature amplitude modulation (see figure 1, Bluetooth standard use QAM modulation), and where the receiver processes the received data streams by evaluating the received data streams at predefined times at which each of the symbols within the transmitted data streams occupies a defined state in the quadrature signal plane (see figure 3, inherent, received signals are converted to baseband for processing).

Regarding claim 18, which inherits the limitations of claim 17, Nafie et al further teach where the receiver determines the defined state that corresponds to the transmitted symbols by sampling and digitizing the received data streams at least at defined times and at a frequency that is lower than the frequency that the data streams are transmitted (see figure 4).

Regarding claim 19, which inherits the limitations of claim 16, Nafie et al further teach where the encoder codes the data sequence using space-time block codes, and where the receiver processes the received data streams using space-time block codes (see figure 1).

Regarding claim 20, which inherits the limitations of claim 12, nafie et al further teach where the transmitters modulate the pair of data sequences onto a high-frequency carrier signal, and where the receiver converts the received data streams to a frequency that is lower that that of the high-frequency carrier signal see figure 3, inherent, received signals are converted to baseband for processing).

Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Micic et al (US Patent 4,621,374) in view of Nafie et al (US PAP 2005/0058216) and further in view of Suzuki et al (US Patent 5, 633862).

Regarding claim 5, which inherits the limitations of claim 1, Micic et al in view of Nafie et al does not expressly teach compressing and decompressing the audio signals. However, there is no criticality in compressing the data in the transmitter and decompressing the data in the receiver. Further, in analogous art, Suzuki et al teach compressing the digitized audio signals prior to the step of transmitting and further comprising the step of decompressing the digitized audio signals after the step of receiving (see column 10, lines 14 – 24). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made o compress and decompress the data. The motivation or suggestion to do so is to efficiently transmit the audio data.

Regarding claim 15, which inherits the limitations of claim 12, the claimed system including the features that corresponds to subject matter mentioned above on the rejection of claim 5 is applicable hereto.

Allowable Subject Matter

Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAISON JOSEPH whose telephone number is (571)272-6041. The examiner can normally be reached on M-F 9:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. J./
Examiner, Art Unit 2611

/Chieh M Fan/
Supervisory Patent Examiner, Art Unit 2611